volumes represent further attempts, along two different lines, to win recognition for apparently supernormal facts, and to frame theories capable of bringing them into line with general knowledge.

Mr. Hill's book (1) is an eminently temperate and dispassionate statement and analysis of selected cases of clairvoyance and automatism, the former including the sayings of a professional clairvoyant, and the latter dealing with the "cross-correspondences," now fairly well known, between the automatic writings of Mesdames Thompson, Forbes, Holland, Verrall, and Piper. It is not difficult to perceive that the author inclines to the agency of disembodied human intelligences as the simplest explanation of many of the phenomena dealt with. When, in circumstances which exclude collusion as a reasonable hypothesis, phrases and allusions are simultaneously written out automatically by two or more persons in different continents, different phrases which only become intelligible on being pieced together, the case for assuming the operation of some intelligence different from that of the writers becomes strong. When, in addition, these phrases are characteristic of a Gurney, Myers, Sidgwick, or Hodgson, the temptation to attribute them to those deceased personalities is obvious. On the other hand, if telepathy and clairvoyance are real faculties, the proof of identity is faced with apparently insurmountable difficulties. Nevertheless, Mr. Hill's book is a valuable contribution to our knowledge of this difficult subject, and it is rendered particularly acceptable by the author's "careful and responsible truthfulness" and "unemotional habit of mind," to which Sir Oliver Lodge testifies in his introduction.

(2) Mr. Constable's book is an ambitious attempt to colligate the same range of facts by a new theory of personality. Experimental telepathy is assumed to be fully established, and is accounted for by the existence of an "intuitive self," which is in "timeless and spaceless" communion with all other intuitive selves. A large part of the book is taken up with a criticism of Kant and his transcendental dialectic, and the new departure claimed is the proof of the existence of the intuitive self from facts of ordinary human experience, chiefly relating to telepathy, or the reception of impressions otherwise than through the normal organs of sense.

The book as it stands can scarcely be said to succeed even in its main object, for even if telepathy were fully established, the possibility of some form of physical vehicle is becoming, if anything, increasingly obvious in these days of wireless transmission; and the whole conception of the "intuitive self" tends to remove these matters from all scientific procedure. An author who confesses his inability "to distinguish between time and space" (p. 34) is scarcely likely to convert physiologists or even psychologists to his views on crystal-gazing, or "psychometry," or communion with the disembodied. Any theory of survival likely to appeal to the scientific mind must be based upon physiological rather than metaphysical reasoning, and must, above all, remain in touch with the facts of racial and individual development. A physical scheme of immortality cannot be ruled out as an *a priori* impossibility while so many unknown forms of matter and energy remain to be discovered. Meanwhile, a transcendental self, independent of space and time, makes too great a demand on our powers of conception to be of any living scientific interest.

E. E. F.

OUR BOOK SHELF.

A Star Atlas and Telescopic Handbook (Epoch 1920). For Students and Amateurs. By Arthur P. Norton. Pp. 19+16 star and 2 index maps. (London and Edinburgh: Gall and Inglis, 1910.) Price 5*s.* net.

FOR the general use of amateur astronomers this is the best atlas and handbook we have yet seen. The sixteen maps are printed exceptionally clearly, and, while not overcrowded, show more than 7,000 objects. Each map is about 10 in. by 8 in., and is part of a lune, covering, exclusive of overlap, four hours of R.A., and 60° N. or S. of declination. The atlas opens out flat, and shows two maps joined together at the equator, so that about one-fifth of the whole sky is seen at once. Meridians and parallels mark every hour of R.A., and every tenth degree of declination, while marginal divisions enable a position to be fixed to the nearest 5m. or 1°. The polar regions are shown on two pairs of maps.

In addition to these excellent maps there are a large number of tables and a quantity of letterpress giving practically all the information the amateur is likely to require for ordinary work. The list of star catalogues, astronomical abbreviations and symbols, and the notes on astronomical terms are to be confidently recommended for their lucidity and trustworthiness. Then there is a number of notes on the planets, comets, meteors, eclipses, &c., which are very interesting, concise, and informative. The sun and moon are awarded rather fuller treatment, and a useful sketch-map of the latter forms the frontispiece.

All this is good, but what will probably appeal more strongly to the average amateur possessing a telescope is the section devoted to hints. These are eminently practical, and the observer is told how to take care of and to use his instrument, how to get to know its constants and capabilities. Should he wish to determine the focal length of his objective or mirror, or of his eyepiece, or the diameter of the field, or should he wish to clean the different delicate parts or undertake special work, he is advised tersely how to do it.

Then preceding each pair of regions there are a few notes directing attention to any special telescopic objects found therein; double stars, variables, nebulæ, and star clusters are located, and their special characteristics briefly described.

The whole work suggests that the author undertook a congenial task; the result shows he did it well.

W. E. ROLSTON.

Triumphs and Wonders of Modern Chemistry. A Popular Treatise on Modern Chemistry and its Marvels, Written in Non-Technical Language for General Readers and Students. By Dr. G. Martin. Pp. xx+358. (London: Sampson Low, Marston, and Co., Ltd., 1911.) Price 7*s.* 6*d.* net.

THE author of this book has sought to make chemistry attractive to readers untrained in the methods of science, by offering them an account of some of the most surprising achievements of modern practical chemistry, and of the most startling deductions from recent chemical and physical speculations. These two subjects alternate throughout the book, but their treatment is of unequal value. Such practical matters as the liquefaction of air, the preparation of oxygen, and

the artificial production of nitrogen compounds, are described in an interesting manner, and in an easy and popular style. The wisdom of the plan adopted in dealing with theoretical points is more questionable. The reader is presented, almost on every other page, with numbers intended to impress by their vastness. Such statements as that "in such an inconceivably short interval of time as the millionth part of the millionth part of a second there occur no less than 2,800,000,000,000,000,000 collisions between the little atomic worlds which make up a [candle] flame!" abound in every chapter, and the latest hypotheses concerning electrons and the æther are utilised freely to supply similar data. The exclamatory style of these portions, and the excessive attention given to the sensational and the marvellous, render much of the book fatiguing to the reader, and injure its value as a means of instruction, especially as no clear distinction is made between those wonders which are facts of experience and the most hazardous guesses as to the structure of the universe.

Some of the most interesting sections deal with natural marvels, such as the caverns of limestone districts, the diamond mines of Kimberley, and the sulphur deposits of Sicily and Japan, and the author's reading has enabled him to bring together a mass of curious information in which most readers will find something new or unfamiliar.

In spite of the defects on the scientific side, to which attention has been directed, it is evident that the author has a real enthusiasm for his subject, much poetic feeling, and considerable facility of expression, and that his book represents a genuine effort to communicate his enthusiasm to others.

Plant-Life on Land, considered in Some of its Biological Aspects. By Prof. F. O. Bower, F.R.S. Pp. ii+172. (Cambridge: University Press, 1911.) 1*s.* net.

THE first part of this book deals with the problem which the author has expounded more fully in his large work on the origin of a land flora. The life-histories of Ulothrix and Pteris, the flower of Cycadeoidea, and the motile sperms of Zamia are the central points in the earlier chapters. Then after discussing the limitations imposed upon plants by fixity of position, the author turns towards the golf links, noting by the way the incidents connected with plant increase and the biological features of sand-dunes. The golf links are introduced to serve as an object-lesson in plant colonisation. Finally, it is explained in the concluding chapter how the various themes treated as separate essays converge upon the all-important problem of descent. The facts and opinions set forth can scarcely fail to interest the general reader, who desires to become acquainted with modern views regarding the origin and development of the plant world, but he is likely to find the information somewhat disjointed and sketchy; thus he would certainly desire to learn more, if only hypothetical, of the transition from the fern to the flowering plant, and also of the evolution of the flower. Botanists are, of course, familiar with the subjects discussed, but to some the tale of the Culbin sands may be new, and all will appreciate Prof. Bower's "dicta" on golf links.

Butterflies and How to Identify them. By the Rev. S. N. Sedgwick. Pp. 63. (London: Charles H. Kelly, n.d.). Price 1*s.* net.

THIS is an excellent little book for the beginner, and contains a quantity of useful information, for which we might often seek in vain in more pretentious works. There is a coloured frontispiece, representing three butterflies and two moths, and thirty-five photographic illustrations (some of them including a whole page of figures), representing scales, eggs, larvæ, and pupæ, besides perfect insects. Some of these are natural size, and others reduced or (occasionally) enlarged, and those of perfect insects are generally good, but the figures in some of the plates representing the butterflies of each month are rather too small, and have scarcely come out very recognisably.

The first chapter deals with metamorphoses, collecting, &c., and the second includes a complete list of British butterflies, with Latin and English names, and a sketch of the contents of the five families. In chapter iii. we find a table giving the month of appearance, food-plant, name, and locality, &c., of each butterfly, then a series of plates, to which we have already referred, showing the butterflies of each month from April to September, then notes on typical larvæ and pupæ, of which a representative series is figured, and, lastly, another table, giving name, brief descriptions of image, larvæ and pupæ, food plants, and locality; and a few pages of ruled paper for notes.

A few doubtful species are included, such as *Argynnis dia* and *Erebin ligea,* but if this is an error, it is an error on the right side. Altogether the book should be specially useful to schoolboy entomologists.

The Open Book of Nature: an Introduction to Nature-Study. By the Rev. Chas. A. Hall. Pp. xi+268. (London: A. and C. Black, 1911.) Price 3*s.* 6*d.* net.

VARIOUS allusions and the general tenor of the book indicate that the author's early proclivities towards natural history were developed at a time when there were few inducements, either in the shape of popular books or general appreciation, to take up the study of the natural sciences. Having derived so much pleasure from his studies he desires to arouse in others the spirit of observation and a similar enthusiasm for a knowledge of nature.

The earlier geological chapters are devoted mainly to dissertations on rocks and fossils; identification of flowers is the chief botanical feature, and zoology is introduced with botany in the description of a ramble which occupies a third part of the book. The final chapter containing practical hints is by no means the least useful, although the manipulation of microscope and camera are better postponed to a more advanced stage. The purpose of the author is best served in those passages where he describes his own observations and experiences. There is overmuch introduction of information which, referring to natural objects not easily obtained, cannot be practically confirmed, and it is certainly inexpedient to give a string of morphological definitions (as on pp. 120 to 130), some of which are admittedly incorrect; it would be wiser in every respect to refer the student to a text-book for such details. Undoubtedly the author would be a delightful companion in the field, but conversations that are instructive on a ramble appear fragmentary when offered as a set piece.

The Oxford Geographies. Edited by A. J. Herbertson. Junior Geography. Questions. Pp. 28. By F. M. Kirk. Statistical Appendix. Pp. 36. By E. G. R. Taylor. (Oxford: Clarendon Press, 1911.) Price 1*s.*

IF these questions and summaries—prepared to accompany Prof. Herbertson's "Junior Geography"—lead teachers to make boys and girls themselves take an active part in their geography lessons, and not merely listen to what the teacher has to say, they will serve a very useful purpose. The resourceful master should find no difficulty in basing practical work upon the material here provided.